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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,764	03/26/2004	David J. Love	TI-35144	9069
23494 7590 04/17/2008 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265				
EXAMINER JOSEPH, JAISON				
ART UNIT 2611		PAPER NUMBER		
NOTIFICATION DATE 04/17/2008		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/810,764

**Applicant(s)**

LOVE ET AL.

**Examiner**

JAISON JOSEPH

**Art Unit**

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 -20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

Claims 1 – 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claim 1 recite the limitation "configured to weight said symbol in frequency domain". However present specification does not disclose weighing the symbol vector in frequency domain. Furthermore present specification does not disclose any operations are done in frequency domain. There is nowhere in the present specification the phrase "frequency domain" can be found. Clarification is required. For the purpose of the art rejection Examiner consider the claim without having the limitation "in the frequency domain".

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2611

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Ketchum et al (USPAP 2003/0108117).

Regarding claim 1, Ketchum et al teach a waterpouring system for use with a multiple-input, multiple-output (MIMO) transmitter, comprising: an encoding decision subsystem configured to select a constellation combination based on gains in channels of said MIMO transmitter (see figure 1, controller 130 and figure 2, and paragraph 54 and 55) an; a vector modulator subsystem, coupled to said encoding decision subsystem, configured to modulate a fixed number of bits in a bit stream with said constellation combination to generate a symbol vector (see figure 1 and 2, and paragraph 57); and a normalization and precoding subsystem, coupled to said vector modulator subsystem, configured to weight said symbol vector in the frequency domain based on said gains to yield a weighted symbol vector and distribute said weighted symbol vector among said channels (see figure 1 and figure 2, component 120a and paragraph 59 –74).

Regarding claim 2, which inherits the limitations of claim 1, Ketchum et al further teach wherein said encoding decision subsystem is configured to select said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of: quadrature amplitude modulation, and phase shift keying (see paragraph 0057).

Regarding claim 3, which inherits the limitations of claim 1, Ketchum et al further teach wherein said gains are configured to be reflected in an ordered, real diagonal matrix (see paragraph 25).

Regarding claim 4, which inherits the limitations of claim 1, Ketchum et al further teach wherein said encoding decision subsystem is configured to select a maximum-rate sub-channel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity (see paragraph 0057).

Regarding claim 5, which inherits the limitations of claim 1, Ketchum et al further teach wherein said weighted symbol vector is configured to have an energy equaling a total transmit energy of said MIMO transmitter (see abstract).

Regarding claim 6, which inherits the limitations of claim 1, Ketchum et al further teach wherein said normalization and precoding subsystem is configured to distribute said weighted symbol vector along an orthogonal right singular vector of a matrix representing said channels (see abstract and paragraph 59 –74).

Regarding claim 7, which inherits the limitations of claim 1, Ketchum et al further teach wherein said MIMO transmitter is configured to form a part of a selected one of a narrowband wireless communication system employing multiple antennas, a broadband communication system employing orthogonal frequency division multiplexing, and a multi-user communication system (see abstract).

Regarding claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 9, which inherits the limitations of claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 2 is applicable hereto.

Regarding claim 10, which inherits the limitations of claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 3 is applicable hereto.

Regarding claim 11, which inherits the limitations of claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 4 is applicable hereto.

Regarding claim 12, which inherits the limitations of claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 5 is applicable hereto.

Regarding claim 13, which inherits the limitations of claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 6 is applicable hereto.

Regarding claim 14, which inherits the limitations of claim 8, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 7 is applicable hereto.

Regarding claim 15, Ketchum et al teach a multiple-input, multiple-output (MIMO) transmitter employing an input bitstream, comprising (see figure 1): a plurality of transmit channels (see figure 1); and a waterpouring system, including: an encoding decision subsystem that selects a constellation combination based on gains in said

transmit channels (see figure 1, component 130), a vector modulator subsystem, coupled to said encoding decision subsystem, that modulates a fixed number of bits in said input bitstream with said constellation combination to generate a symbol vector (see figure 1 component 130, 114, 120, and figure 2, components 114a), and a normalization and precoding subsystem, coupled to said vector modulator subsystem, that weights said symbol vector based on said gains to yield a weighted symbol vector and distributes said weighted symbol vector among said transmit channels (see figure 1, components 114, 120, 130 and figure 2, component 120a and paragraph 55 – 74).

Regarding claim 16, which inherits the limitations of claim 15, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 2 is applicable hereto.

Regarding claim 17, which inherits the limitations of claim 15, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 3 is applicable hereto.

Regarding claim 18, which inherits the limitations of claim 15, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 4 is applicable hereto.

Regarding claim 19, which inherits the limitations of claim 15, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 5 is applicable hereto.

Regarding claim 20, which inherits the limitations of claim 15, the claimed apparatus including the features correspond to subject matter mentioned above in the rejection of claim 6 is applicable hereto.

Claims 21 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Oprea (US Patent 7,327,795).

Regarding claim 21, Oprea teaches an OFDM MIMO transmitter for transmitting a fixed number of bits at each transmission (see figure 1), comprising an encoding decision subsystem configured to select a constellation combination from a constellation set based on the fixed number of bits (see figure 1 and column 16, lines 33 – 55).

Regarding claim 22, which inherits the limitations of claim 21, Oprea further teaches wherein the fixed number of bits is eight and the constellation combination is selected from a group of constellation combinations consisting of: (16-QAM, 16-QAM), (64-QAM, 4-QAM), and (128-QAM, BPSK) (see figure 1 and column 16, lines 33 – 55).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAISON JOSEPH whose telephone number is (571)272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaison Joseph  
04/10/2008

/Chieh M Fan/  
Supervisory Patent Examiner, Art Unit 2611